

The Environment and Technological Advancement

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Abstract

Innovative thinking and digital technologies are essential for advancing sustainable development. It's crucial to recognize that technological improvements can affect sustainability in both positive and negative ways. To improve sustainability results, it is crucial to have a thorough understanding of how people and organizations are utilizing these technologies. The objective of this article is to ascertain and evaluate the principal prospects and obstacles linked to the integration of technology in sustainable development. In addition, we have suggested several study topics and noted several research gaps that will require further investigation. Four main categories have been established for these research topics. The first three classifications center around the natural world, financial benefits, and society, the three pillars of sustainability. Study agendas that apply to all three of the environmentally friendly aspects are included in the fourth category, which is a general category. The knowledge gained from this research adds to the body of knowledge in several theoretical ways and has important applications for developers, decision-makers, and professionals. The major opportunities and difficulties associated with adopting technology for environmental development were noted and examined in this study. A bibliometric analysis is also performed to find and investigate research gaps. Future study issues and areas were recommended based on these research gaps. A surge in political and economic internationalization has been made possible in recent years by the creation of legislation, the removal of trade barriers, and technological advancements, particularly in the areas of transportation, energy, and telecommunication. Apart from the incentives associated with industrialization, advancements in technology across many economic domains have also played a role in exacerbating the environmental repercussions of economic expansion.

Keywords: Environmental Responsibility, Technological Sustainability, Global Sustainable Development, Product and Technology, Innovation Strategies, Tools and Methods

Introduction

In a globalized world, advancements in technology, increased technical innovation, and efficiency all have a growing impact on how the economy operates, and productivity, with a strong connection between the business, social world, and environmental facets and the economy. Innovation in technology and products is essential to attaining the goals of sustainable socioeconomic development and the ongoing enhancement and refinement of production quality across all economic domains. Environment technologies and technology for sustainable development, however, serve different purposes, considering environmental technology, production, and cleanup capabilities. Sustainable technologies, in addition to their primary focus on reducing, eliminating, and offsetting pollutants in the environment, also aim at attaining the more general goals of stabilizing growing inequality and avoiding going over the ecological healing ability in the process of achieving socioeconomic and environmental aims. The best current technologies (BAT) for environmentally

friendly growth are those that meet the highest standards for technical capability, affordability, and ecological superiority for the relevant industry (Feola 2015; Majerník et al. 2017).

To fulfill the aspirational objectives of worldwide growth tactics for sustainability, regarding the environmentalization of technologies, a variety of preventative measures and techniques are employed. These instruments are being standardized as the International Organization for Standards improved through investigation, and synchronized on a worldwide basis. From a technological viewpoint, the subsequent development of smart industries strategy's execution and continuous amplification within the parameters of the establishment of the business sector a score of ideas in the green economy's ecological restoration [1, 2-3].

Features of Environmentally Friendly Technologies

Sustainable techniques have a wider extend beyond only reducing contamination and stopping ecological degradation by ongoing production growth. With the help of

sustainable technology, it is possible to meet population demands without exceeding the planet's carrying capacity or the potential of nearby ecosystems. Their goal is to meet humankind's requirements worldwide while adhering to the laws of conservation and without going over the maximum capacity of the planet. They also want to achieve this by using standardized social and economic measures that foster long-term socioeconomic growth. The following are some essential components of environmentally friendly technologies [4, 5-7]:

Environmental Responsibility: Ecologically friendly technology should reduce its negative effects on the surroundings and help to contamination and release of greenhouse gases.

2.2. Resources Effectiveness:

To minimize wastage and reduce the consumption of biodiversity, environmentally friendly gadgets should make effective use of natural assets like energy and essential components.

2.3. Life Span: Eco-friendly technologies ought to be built to last, minimizing garbage and avoiding the need for regular maintenance.

2.4. The Affordability: To both the initial expense and continuing ongoing expenses,

green technology should be financially feasible.

2.5. Social Consequences: Social justice and inclusivity should be enhanced by environmentally friendly innovations, and limiting detrimental effects on underprivileged populations while benefiting all sections of society.

2.6. Creativity: environmentally friendly inventions must accept fresh and creative methods for resolving global problems while promoting continuous advancement and investigation.

2.7. Availability: To be broadly embraced and significantly contribute to minimizing harmful emissions, sustainable technology needs to be made adaptable [8, 9-10]

3. Forward-thinking techniques and Instruments for Innovative Environmental Technology

3.1. Cleaner Manufacturing (CP)

It stands for the application of the preventive, and practical principle—the cornerstone of the strategy in real life. Reducing pollution, restricting pollution at the source, preventing pollution, and using cleaner technology and production methods are the main components of CP. By promoting cutting-edge technologies and eco-innovations that are more

ecologically benign, the European Union's Advanced Technology Action Strategy aims to promote economic growth. The twenty-eight actions that make up the four groups that comprise this aim are as follows: the research-to-market pipeline, enhancing market circumstances, operating internationally, and making constant progress [11].

3.2. Life-cycle Analysis (LCA) It serves as a resource for environmental product policy information. It is defined by the International Standards Organization (ISO) 14040 as the gathering and assessment of inputs, outcomes, and possible effects in connection to the stages of a goods or service's whole cycle. It benefits experts in corporate advertising and ecological design, in the choosing of novel goods, the ecolabelling process, the creation of rules and standards, the administration of government, as well as the advancement of science and technology [12, 13].

3.3. Eco-labeling: The objective is to establish a market for eco-friendly goods to persuade manufacturers and buyers to lessen the product's detrimental effects on the environment. The International Standards Organization (ISO) 14020 series of standards distinguish between three forms of eco-labeling: Sort Labeling is voluntary and is used

by public as well as private organizations. It may be local, national, or global in scope (e.g., EU-European Flower Label). Type II products self-declare themselves by text, symbols, or visual expressions on their labels or packaging. Type III refers to written data that is quantifiable and appears on semi-finished goods, raw materials, and completed goods; it is not meant for consumer use. Technology is included in the evaluation as well as technological innovation is included in the evaluation as well. The Best Accessible Technology is concerned [12, 13].

3.4. Ecological Expense Management

To make decisions within a specific context, it deals with the identification, gathering, calculation, research, reporting, and distribution of information on energy and material flows, sustainability expenses and advantages, as well as additional details concerning value. The business world, science and technology, and organization. With the goals of enhancing resource and energy effectiveness, minimizing the negative environmental effects of company operations, goods, and offerings, lowering hazards to the environment, and enhancing business performance, it tracks and assesses value-oriented information gathered from

management and accounting systems in monetary terms as well as data on substance and energy consumption [14,15].

3.5. Evaluating: How Well the Product System Performs Environmentally The product platform's potential can be studied with the environmental implications of the system by the stakeholders using this measurement method. The ideas, specifications, and directives for the assessment are outlined in the world standard ISO 14045. These consist of establishing the goal or scope, evaluating the product system's

environmental value, quantifying its ecological impact, providing quality control, reporting, and critically analyzing the examination [14,15].

4. Technological Surroundings Components

4.1. Novelties and Advancement

Findings and technological advancements have the power to completely change the way businesses function. They present chances for better goods, services, and procedures. For instance, the advent of smartphones altered how businesses engage with their clientele and gave rise to new forms of communication.

4.2. Digital Conversion

Companies are using digital tools and platforms to interact with customers and

optimize processes. Customized marketing, evaluation of information, and internet sales are made possible by digitalization. Businesses that follow this trend frequently see improvements in customer satisfaction and expand their consumer base.

4.3. Data Analysis and Handling of Data

Data collection, analysis, and utilization skills are essential. It facilitates understanding client preferences, forecasting trends, and making well-informed judgments. E-commerce platforms, for example, utilize user activity tracking to provide product recommendations that increase sales.

4.4. Effectiveness and Automation

Automation is the use of hardware and software to carry out operations that were previously completed by people. It saves time, increases productivity, and lowers errors. For example, the use of robots in industries for assembly has resulted in faster and more accurate manufacturing. The Techniques to Reduce the Risks Associated with the Technological World Technology presents commercial enterprises with threats in addition to benefits. To remain competitive, companies need to overcome these threats. These are the five tactics that you might use in your company.

4.5. **Internet Presence and Electronic Commerce**

The growth of e-commerce has changed how companies market their goods. Reaching a worldwide audience demands having a digital identity on social networking platforms and sites. Marketing, brand awareness, and consumer involvement are all impacted by this.

4.6. **Transparency and Online Safety**

Cyber risks are evolving along with technology. It is crucial to safeguard private client information and sensitive data. Businesses spend money on cybersecurity safeguards to avoid security lapses that could harm their brand and cause losses [16].

5. **Techniques to Reduce Technology Advancement Risks**

Technology presents commercial enterprises with threats in addition to rewards. To remain economically viable, businesses need to deal with these challenges. These are the five tactics that you might use in your company

5.1. **Ongoing Education and Adjustment**

Keep abreast of technology advancements by continuing your education. Accept new methods and tools that fit your company's objectives. This adaptability guarantees that your business is ready to quickly adjust to shifting technological environments.

5.2. **Adding Flexibility and Adding Reliability:**

Don't depend just on one platform or piece of technology. Establish backup plans to guarantee uninterrupted operations in the event of a technology breakdown. This reduces the chance that disruptions will have an impact on your company.

5.3. **Cybersecurity Concerns**

Invest in strong cybersecurity to safeguard your online properties. Employ firewalls, encryption, and secure accounts to protect private information against potential dangers like hacking and data theft.

5.4. **A Customer-First Mentality**

Recognize the technological preferences and usage patterns of your clients. To increase the likelihood that customers will stick with your company despite shifting technological trends, customize your goods and services to suit their demands.

5.5. **Working Together and Establishing Connections:**

Make connections with professionals, colleagues, and trade associations. Work together to exchange ideas and possible technological obstacles. Together, you can develop a shared awareness of how to negotiate and counteract risks in the digital world [16].

6. A Role in Preserving the Nutritional

Value and Security of Food: The meat sector is currently experiencing significant upheaval, with opportunities and obstacles changing the landscape. The increasing emphasis on sustainability and its link with global problems such as the issue of deforestation and greenhouse gas emissions is serious. Another challenge comes from changing consumer preferences, such as growing interest in plant-based alternatives, which forces traditional meat producers to adapt and provide new concepts. Global supply chain breakdowns are a recurring issue, as shown by pandemics and geopolitical upheaval. Resilient processes rely significantly on the industry's ability to recover and adapt to these disruptions. Moreover, the stringent regulatory structure demands ongoing efforts to ensure commitment to evolving food benchmarks for food safety, value, and integrity that necessitates ongoing investments in practices and technology. On the other hand, the industry has a lot of opportunities. The introduction of alternative proteins such as those made from plants and grown in labs offers a chance to diversify and expand specific markets. Continuous technological developments, such as automation along with

information analytics, present opportunities for increased traceability, effectiveness, and quality control, assisting the industry in overcoming a variety of challenges and maintaining its competitiveness. The meat industry thanks to the emphasis on good health trends, there is a potential to develop superior product offers, such as slimmer cuts and alternatives that meet particular dietary requirements. With retail exposure to consumers and new opportunities for distinguishing goods, straight-to-consumer, and e-commerce methods are transforming marketing as well as distribution. Additionally, companies that prioritize providing clear information about sourcing, production methods, and sustainability practices stand to gain a great deal from the increased need for transparency from customers. Gaining a competitive advantage in a market where consumer expectations are constantly shifting can be achieved by cultivating trust through transparent and ethical company practices [17-19].

The Drawbacks of Conventional Approaches in a Modern Context

Meat processed for preservation has become more prevalent due to the need to meet novel

difficulties and client demand while preserving environmentally friendly practices. Because of their weaknesses in consistency, quickness, and considering environmental effects, conventional methods like salting, drying, and smoking have been examined. Contemporary preservation methods prioritize environmentally responsible procedures, uniformity, and less chemical use, showcasing a commitment to balancing environmental stewardship with culinary legacy. It is necessary to tackle the environmental implications of conventional approaches to attain sustainability. For instance, smoking is a common traditional conservation technique that worsens deforestation and pollutants in the air. However, contemporary preservation methods aim to minimize resource consumption and waste generation. Moreover, the inconsistencies in the results obtained from traditional methods due to factors such as human skill levels and ambient conditions underscore the necessity for more predictable and efficient preservation techniques. Advances in technology are used in modern approaches to provide uniformity and satisfy the stringent standards set by regulatory agencies for quality and safety. A reduced dependency on chemicals is essential

for effective and long-lasting preservation. The goal of modern preservation techniques is to eliminate preservatives while maintaining the quality and safety of the product. This goal is motivated by consumer demand for better nutrition and better branding. The sensory qualities of meat products have also been taken into consideration in the development of preservation techniques. Contemporary preservation methods place a strong priority on preserving the meat goods; sensory qualities to suit customers who prefer meals that are natural and hardly processed.

Conclusions

Tactical decisions in the areas of social and economic policy and management at both the global and local levels. A longer temporal horizon has to constantly be considered in its growth. Growth in business scenarios, resilience as an approach, and breakthroughs in technology, materials, ecosystems, and energy are interrelated and mutually reinforcing. This leads to mutual technical, ecological, and organizational interconnectedness as well as depending on each other for their growth. Consuming, manufacturing, methods, and actions all have cumulative, occasionally permanent effects on the surroundings. As a result, there is now a clear connection

between the future of humanity's economic prospects and standard of living and the strategic decisions made today. The study of sustainability issues and obstacles has to provide methods for utilizing traditional science while accounting for the multifaceted nature of these problems and, most importantly, keeping an emphasis on invention, activity, and execution.

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None that the writers are aware of exist. The decision to publish the Study's findings was made independently of the funder, who also had no say in the study's design, gathering and analyzing data comprehension, or article authoring.

References

1. Chaminade, C., Lundvall, B. Å., & Haneef, S. (2018). *Advanced introduction to national innovation systems*. Edward Elgar Publishing.

2. Chovancová, J., Rovňák, M., Shpintal, M., Shevchenko, T., & Chovanec, F. (2022).
3. Perception of benefits and barriers associated with the management systems integration – A
4. comparative study of Slovak and Ukrainian organizations. *TEM Journal*, 11(2), 772.
5. Feola, G. (2015). Societal transformation in response to global environmental change: A review of emerging concepts. *Ambio*, 44(5), 376–390. <https://doi.org/10.1007/s13280-014-0582-z>
6. Luukkanen, J., Kaivo-Oja, J., Vähäkari, N., O'Mahony, T., Korkeakoski, M., & Panula-Ontto.
7. Majernik, M., Daneshjo, N., Chovancová, J., & Sanciova, G. (2017). Design of integrated management systems according to the revised ISO standards. *Polish Journal of Management Studies*, 15(1), 135–143.
8. Majerník, M., & Drabik, P. (2020). *Sustainable development and environment*. Petit s.R.O.
9. Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy*, 41(6), 955–967. <https://doi.org/10.1016/j.respol.2012.02.013>

10. Munasinghe, M. (2009). Sustainable development in practice. Cambridge University Press.
11. United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations.
12. Vacchi, M., Siligardi, C., Demaria, F., Cedillo-González, E. I., González-Sánchez, R., & Settembre-Blundo, D. (2021). Technological sustainability or sustainable technology? A multidimensional vision of sustainability in manufacturing. *Sustainability*, 13(17), 9942. <https://doi.org/10.3390/su13179942>
13. Weaver, P., Jansen, L., Van Grootveld, G., Van Spiegel, E., & Vergragt, P. (2017). Sustainable technology development. Routledge.
14. Capper, J. L. (2020). Opportunities and challenges in animal protein industry sustainability: The battle between science and consumer perception. In *Animal Frontiers: The Review Magazine of Animal Agriculture*, 10(4), 7–13. <https://doi.org/10.1093/af/vfaa034>
15. Frontiers.Oxford University Press (OUP),10(4),7–13. <https://doi.org/10.1093/af/vfaa034> .
16. <https://doi.org/10.3390/app12146986>
17. Echegaray, N., Hassoun, A., Jagtap, S., Tetteh-Caesar, M., Kumar, M., Tomasevic, I., Goksen, G., & Lorenzo, J. M. (2022). Meat 4.0: Principles and applications of Industry 4.0.
18. Technologies in the Meat Industry. In *Applied Sciences*, 12(14), 6986. MDPI AG.
19. ISO 1405. (2011). Environmental management. Cost accounting of material flow.
20. ISO 14045. (2012). Environmental management. Environmental performance assessment of product systems. Principles, requirements and guidelines.
21. Hogarth, J. Green economic development in Lao PDR: A sustainability window analysis of Green Growth Productivity and the Efficiency Gap. *Journal of Cleaner Production*, 211, 2019, 818–829.
22. Huttmanová, E., & Valentiny, T. (2019). Assessment of the economic pillar and environmental pillar of sustainable development in the European Union. *European Journal of Sustainable Development*, 8(2), 289–289.
23. Rahman, M., Hashem, M., Azad, M., Choudhury, M., & Bhuiyan, M. (2023). Techniques of meat preservation- A review. In *Meat Research. Bangladesh Meat Science*

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Association,3(3).

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<https://doi.org/10.55002/mr.3.3.55>

Shodh Sari-An International Multidisciplinary Journal, 03(02), 289–294.

24. Sujan. (August 6, 2023). Technological environment of business: Definition, factors, examples, and strategy. <https://mbanote.org/technological-environment/>

<https://doi.org/10.59231/sari7704>

25. United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations.

30. Kumar, S., & Simran. (2024). Equity in K-12 STEAM education. *Eduphoria*, 02(03), 49–55. <https://doi.org/10.59231/eduphoria/230412>

26. Zhou, G., Zhang, W., & Xu, X. (2012). China's meat industry revolution: Challenges and opportunities for the future. In *Meat Science*. Elsevier BV, 92(3), 188–196. <https://doi.org/10.1016/j.meatsci.2012.04.016>

31. Orji, E. I., Idika, D. O., Okeke, S. U., Anakwue, A. L., & Ntamu, B. A. (2023). Global Warming and Impacts: Green entrepreneurship to the rescue. *Shodh Sari-An International Multidisciplinary Journal*, 02(04), 222–237. <https://doi.org/10.59231/sari7636>

27. Kumar, A. (2023). Promoting youth involvement in environmental sustainability for a sustainable Future. *Edumania-An International Multidisciplinary Journal*, 01(03), 261–278. <https://doi.org/10.59231/edumania/9012>

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28. R, B. (2023). Harnessing happiness in Education: Fostering youth leadership. *Edumania-An International Multidisciplinary Journal*, 01(03), 209–216. <https://doi.org/10.59231/edumania/9008>

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29. Sehgal, R., & Kaur, A. (2024). Role of mindfulness and stress management in enhancing life skills for sustainable living.